IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Scott J. Clifford et al.	)	
	)	Group Art Unit: 1734
Serial No.: 10/691,763	)	
	)	Examiner: G. Koch
Filed: October 23, 2003	)	
	)	Attorney Docket: 132815-7
For: Modular Painting Apparatus	)	(formerly 16129)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF SCOTT J. CLIFFORD UNDER 37 CFR 1.132

Honorable Sir:

SCOTT J CLIFFORD declares as follows:

1. I am a joint inventor of the subject matter of the above-identified patent application.

2. I received a Bachelor of Science degree in Applied Science in 1983 from Miami University in Oxford, Ohio.

3. From 1989 to date, I have been employed by Fanuc Robotics America, Inc., Rochester Hills, Michigan, assignee of the above application. My present position is Principal Engineer, Paint Systems Automation Group..

4. I have studied U.S. Patent No. 4,781,517 issued on November 1, 1988 to Pearce et al. and entitled "Robotic Automobile Assembly". Through my work at Fanuc Robotics America, I am familiar with the construction and operation of robots for performing operations on work pieces and the support structures for such robots.

5. The Pearce et al. patent describes a first embodiment of his robotic assembly system with reference to Figs. 1-12. It is stated in Col. 3, Line 36 through Col. 4, Line 12:

> FIG. 2 is a general schematic view of one robotic station which for simplicity has one robot member 71 and one vision system indicated at 32.
>
> As illustrated a typical robot member in accordance with the present invention has the capacity to move or be moved in the direction of each of the arrows, ie. along the plane of the frame 21; transversely cross the frame 21; about the vertical axis of the robot member 71; and lower tool attachment member 113

(see FIG. 8) may be moved about a horizontal axis normal to the vertical axis of robot member 30.

For convenience in this application these axes will be referred to, respectively, as the "X" axis; the "Y" axis; the "Z" axis; the "P" axis; and the "R" axis.

The automobile upon which the work is to be done is indicated in dotted outline at 50 and moves under the frame 21 on a carriage 52 along a carriage track 51.

The bridges such as 24 comprise a pair of spaced apart members 41 and 42 which are connected by bridge ends such as 43 and 44.

On the bridge ends, motors such as 45 and 46 are mounted, and these motors are connected through a chain drive 47 and a ball nut assembly 48, shown in the breakaway in FIG. 3, which engages with a ball screw 49. Members 41 and 42 are supported by brackets such as 60 and 61 and shaft 62. Rod 62 is further supported by bearings 63 and 64 and bridge 24 is movable along rod 62. It will be understood that required suitable bearings and supports will be provided in accordance with approved engineering practice.

It will also be understood that each pair of motors 45 and 46 operate synchronously so that they move together and on operation of these motors through the engagement of the ball nuts and ball screws the bridges 24 will move along the frame 21 as indicated by the arrows, 70. The ball screw and ball nut engagement permits each of the carriages on each frame to be moved independently of the other and to permit the movements to be extremely fine, ie. of the order of thousandths of an inch. This almost infinite adjustment provided by the ball screw drive is a factor in accommodating the fine adjustment required of the robot tool heads. It will be apparent that it is the driving of the ball nut assembly which permits the independent movement of each of the carriages.

6. As shown in Fig. 2 of the Pearce et al. patent, the bridge 24 moves along the "X" axis relative to the lateral members 22 of the frame 21 and the robot carriage 71 moves along the "Y" axis relative to the bridge 24. This relative movement is confirmed by the arrows 70 in Fig. 3 in which the bridges 24 are shown in solid and phantom lines.

7. As seen in Fig. 1, the bridge members 24, 25, 26 and 27 move from the positions shown at the conveyors 500 toward the car bodies 50, as described above, in order to place the doors in the door openings.

8. It is stated that Figs. 13-18 illustrate those stations in accordance with the present invention which have a facility for assembling components to the automobile body (see Col. 5, Lines 65 through Col. 6, Line 2). The bridge members 24 and the lateral members 22 also are shown in Fig. 15 used in a deck lid mounting station. The door mounting stations 11 and 12 of

Fig. 1 are illustrated in more detail in Figs. 16-18 wherein a front door mounting station is illustrated. See the description of these figures in Col. 3, Lines 6-13 as "a front door mounting station in accordance with the present invention". The stations shown in Figs. 16-18 are substantially the same as those shown in Figs. 13-15 (see Col. 6, Lines 45-48). The robot carriage **525** is moved over to a position above the accumulator **500** where it picks up a door **526** and moves through 90° and into an approximate assembly position. This rotation about the "Z" axis (vertical) is shown in Fig. 18 presented below. In order to move the doors **526** from the positions shown in Fig. 18 to the automobile body, the bridge members A and B (24) on which the robot carriages **525** are mounted move from the accumulators **500** to the body along the lateral members (22). As stated, the bridges, robot carriages and the tool mounts carrying doors are adjusted to accommodate the deviation (Col. 6, Line 68 through Col. 7, Line 2). Clearly, the bridge members A and B shown in Figs. 17 and 18 move relative to the lateral members as do the corresponding members shown in Figs. 2 and 3.

9. If the movement of the bridge members A and B (24) on which the robot carriages **525** are mounted relative to each other and relative to the plane of an upper surface of the automobile body is prevented, as suggested by the Examiner, the robotic system will be inoperative. As clearly shown in Fig. 17, the bridge members A and B (24) must be able to move to three different positions: 1) adjacent the accumulator **500** to pick up a door; 2) adjacent the accumulator **500'** to pick up a door; and adjacent the automobile body to install the doors. There is no teaching or suggestion in the Pearce et al. patent that movement of the bridge members A and B (24) relative to each other and relative to the plane of an upper surface of the automobile body should be prevented.

10. I further delcare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: July 5, 2005

By Scott J. Clifford
Scott J. Clifford